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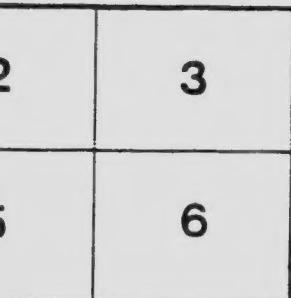
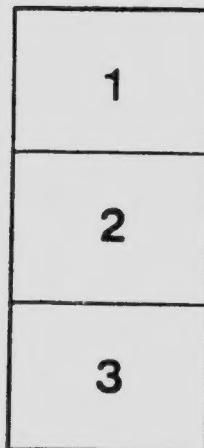
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Re-settlement and Cultivation of Land in British Columbia

An Address delivered before
St. John's Literary Society,
Vancouver, British Columbia
January 12th, 1915

by
WILLIAM SINCLAIR

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PREFATORY NOTE

When the following address was written, it was not intended for publication, as its crude form will clearly show. It is issued in response to the demand for information on Land Clearing and Cultivation. In clearing forest land for cultivation, the universal system is to adopt the burning process. This yields a large quantity of potash, one of the most powerful stimulants to vegetation. The first crop taken from burned land is usually oats or potatoes. The potash stimulates the plants to such an extent that they suck up every atom of organic matter left by the burning, so that the ground is completely sterilized and impoverished. The second crop having nothing to feed on, is a failure, and the cultivator in many instances gets disheartened and quits. The system of

clearing described in the booklet, is the very opposite, and is accomplished by burying instead of burning, thus converting into plant food all the waste materials that have been accumulating for ages.

The favorable reception of the address and the eager demand for practical information on Land Clearing and Cultivation have encouraged the writer to extend his notes on many topics that may be helpful to cultivators. The present effort may therefore be regarded as preliminary to a more systematic and detailed publication in the near future.

W. SINCLAIR.
Dunpenderham,
Port Moody.

29th March, 1915.

*Copy of paragraph in "Daily Province," Vancouver, Wednesday,
January 13th, 1915.*

ON LAND CULTIVATION

Interesting Lecture Before St. John's
Literary Society.

Under the auspices of St. John's Literary and Social Society a good audience assembled in the hall last night to hear a lecture by Mr. William Sinclair on re-settlement and cultivation of land in British Columbia. The lecturer, introduced by Mr. Dunlop, gave a very interesting account of his experience in Coquitlam district in converting—in a few years—virgin forest into smiling land; and, in commending the agricultural life, he impressed the audience as a man in love with Nature, and showed that great things may be done by allying her secrets with the maximum of honest effort. As an instance he pointed out that whereas in one year, the Ottawa Experimental Farm pro-

duced 10,000 pounds of fruit per acre, he grew, in the same year, 20,000 pounds per acre and in the next year 34,000 pounds. The lecture was alive with points of interest pithily put.

Mr. Sinclair made an interesting allusion to the homely potato. In mentioning the much prized Dunbar Reds in England he said he was delighted to find that by adapting a mineralized sand in Coquitlam exactly the same quality of potatoe can be obtained.

Questions were asked and fully answered, and on the motion of Rev. Mr. Pidgeon a hearty vote of thanks was passed to Mr. Sinclair, who as a genial oragenarian with wide experience, is just the man to give skilled advice to intending settlers. "Back to the land" is a call which made an attractive claim on the audience last night, and through it, perhaps to a wider circle.

Entered according to Act of the Parliament of Canada in the year 1915, by
William Sinclair, at the Department of Agriculture.

[Application for copyright in U. S. A. filed at Washington, D. C.]

RE-SETTLEMENT AND CULTIVATION OF LAND IN BRITISH COLUMBIA

During this eventful year of 1914-1915, when the life-blood of the most highly civilized nations is being poured out on the battle-fields of Europe, and many other regions of the globe, the question of food supply to combatants and non-combatants is agitating the minds of thoughtful people everywhere. Every part of the British Empire is contributing nobly to the general stock of supplies, and Canada, as the senior member of the national family of daughter-wearing the Union Jack, has the responsibility, and the honour and glory of leading the van in the array of nations forming the British Empire, upon whose shores the sun never sets. While the general result of the food contributions throughout the Empire is very creditable, there is unfortunately, unmistakeable evidence that here, in British Columbia, the production of food is far below what it ought to be.

Robbie Burns, when in the Kirk one Sunday, detected, on the tresses of a young person before him, an objectionable little creature, which furnished the subject of a humorous and sarcastic address, thus:—

"O' wad some Power the giftie gie us,
To see oorsels as ithers see us."

During the present crisis, the residents in British Columbia may, very appropriately, apply these suggestive lines to their food-producing conditions. All over the province, neglected and deserted homesteads tell, too plainly, the wretched condition of the land cultivating industry. Again, a humorous illustration from that great modern storehouse of intellect and energy,—the Scottish Presbyterian Church, may be quoted from Dean Ramsay's Reminiscences of Scottish Life and Character:—

"A functionary of a country parish is usually called the *minister's man*, and, to one of these who had gone through a long course of such parish official life, a gentleman one day remarked,—"John, ye hae been sae lang about the minister's hand that I dare say ye could preach a sermon versell now." To which John modestly replied, "O na sir, I couldna preach a sermon, but maybe I could draw an inference." "Well, John," said the gentleman, humouring the quiet vanity of the beadle, "what inference could ye draw frae this text, 'A wild ass snuffeth up the wind at her pleasure?' (Jer. ii:24). "Well, sir, I wud draw this inference, he wud snuff a lang time afore he wud fatten upon't."

Present conditions in British Columbia lead to the conclusion that many simple people have been "snuffing wind" for some years past. In the illustration given above the quadruped snuffed a wholesome natural product, full of ozone, and other health-giving substances, but the unfortunate bipeds in B. C. have been sniffing a spurious imitation wind, invented, patented and exclusively manu-

factured and sold in B. C. for home and foreign consumption. It was to be had in special brands labelled to suit every locality, and warranted, like patent medicines, to cure every ill to which flesh is heir. The whirlwind of mental intoxication has come and gone, leaving many wrecks behind, and it is now the duty of the rising generation to avoid the follies of the past and start to build up the fabric of a sound and vigorous community on safe and sane principles.

Cultivation of the land, and development of the agricultural and horticultural resources are the basic industries of every permanently prosperous country. The introduction of these industries into the British Empire may be said to date from the occupation of the country by the Romans. The natives of Britain in those days appear to have subsisted chiefly on the products of the forest and the waters, and very little on that of the fields. Unlike many other military conquerors, the Romans started to develop the resources of the country by building harbours on the coasts and roads throughout the country, and instructing the natives to cultivate the land. They also introduced their famous laws, which have for nearly 2,000 years been the key-note of British freedom. Along with their peaceful institutions, the Romans appear to have left us another precious inheritance engrained in every true British heart, and that is the military instinct of defence (but not defiance), both by land and sea. In glancing at the early history of the British Empire, and the geographical position of the islands, there seems to be a close resemblance to the conditions in British Columbia. Both countries are on the Western limits of a great continent and in the same parallels of latitude. Here, we have not only the outer fringe of islands, but the whole breadth of the Continent as an inheritance. We have the corresponding coast line to Norway, Denmark, Germany, Holland, Belgium and the northern part of France. All the vegetables and fruit products of these countries can be grown here, and there is a great future for the husbandman in this country. What British Columbia very much requires at the present time, is an immense army to enter upon the land, cultivate it properly, and produce abundance of food for man and beast. An army for such a peaceable purpose may, and ought to be composed of both sexes, of all ages, from youth to old age, and, if the members are actuated by the right spirit of patriotism, and remember that they are members not only of a prosperous local community, but citizens of the greatest empire the world has ever seen, the result will be the fulfilment of the poet's dream of the time "When man to man the warld o'er, shall brothers be for a' that." In coming before you this evening to speak to you on the land question, I have to offer an apology for accepting your invitation through the Rev. E. Leslie Pidgeon, as it is the first occasion that I have attempted to address an audience on such a topic. It may help to a better understanding of what I am going to say if I explain how my information was acquired, and shall endeavour to do so with as little objectionable egotism as possible.

The son of a fruit grower in the Garden of Scotland, I was born in an orchard, and from infancy had daily opportunities of learning the details of fruit raising and marketing, and the culti-

vation of field crops and stock feeding. In early manhood I was appointed secretary to a district horticultural society, and, during my tenure of that office, frequently met the leading horticulturists over a wide area. For many years, my occupation was in the city of Edinburgh, but I resided outside the city and had a small garden, in which I carried on experiments in cultivation. A break in my career occurred during the Boer war, and I then came to British Columbia and obtained a free homestead in Coquitlam, where I carried on operations in the heart of the primeval forest, and spent ten years in clearing and forming a fruit orchard. My plan of bringing out my family at the end of two years miscarried, an illustration of the truth that "the best-laid schemes o' mice and men gang aft agley." In youth, I had read Zimmerman on Solitude, but my practice of what he regarded as a bookworm's virtue, was involuntary, and, instead of being bestowed upon paper and ink productions, my studies were mostly devoted to the grandest of all scientific works, the great book of nature. Rural life brings one into daily contact with the wonders and beauties of creation as revealed in geology, botany, and natural history. Meteorology offers an endless variety of phenomena; astronomy reveals by day the ever-changing but regular course of the unwearied sun, the great source of all our planetary health and energy, while, in the nights, when the darkness is greatest, we are privileged to gaze into the unfathomable depths of the universe beyond, and realize to the full the meaning of the oft-quoted line, "The heavens are telling the glory of God." When such passages are set to music, as they are most appropriately in Hadyn's oratorio, "Creation," any doubts as to the existence of a Divinity must vanish for ever. The study of astronomy shows us the insignificance of man and all his works, and the planet we inhabit to be a mere speck of dust in the great universe.

It has been the fashion in some quarters to sneer and make disparaging remarks about the cultivators of the soil, and, through lack of knowledge and a timidity in asserting the true dignity of their calling, a very large proportion of the young men brought up to rural life have gravitated to the cities. To counteract this abandonment of the land is one of the greatest problems of the present time, and in British Columbia it has reached an acute stage. One of the first things to be done, as I have endeavoured to show in these preliminary remarks, is to break down the unreasonable walls of prejudice against country life, and to show that, in a rural home, there is a sphere for the display of the highest intellectual activity. Viewed aright, rural life, by stimulating all the generous instincts of humanity, and in constant touch with all the glories of creation, man comes to realize his true position in the scale of being, endowed with humility and reverence becoming the Sons of God. Filled with such thoughts, and the child-like confidence of every true believer, a man may, even in this world, literally, "walk with God."

Imbued with such sentiments, the people of the British Empire cannot fail to succeed in converting the waste places in His Majesty's Dominions into fertile fields, and thus promote peace and prosperity among all nations.

The homestead granted to me by the Dominion Government had been held by a young man for some years. After holding it nominally for several years without making any attempt at clearing or cultivation, he was told that he must reside for the prescribed period and start clearing and cultivation. He then built a small house of split cedar, but only occupied it for a few days and made no attempt at cultivation. He was then persuaded to renounce the holding. I arrived on the scene a few days later, and was duly installed about the 11th of April, 1902, and subsequently paid for the value of the house. The house was built on the "balloon" principle, i.e., without standards, or corner posts, the roof being entirely supported by the double boarding of the walls. The rafters were four feet apart, without struts or stays. These, I added, along with some other details, but for a considerable time I could see daylight between the boards all round, and ventilation was therefore of the most perfect description, and for five years I enjoyed splendid health. The building was very carefully put together and reflects great credit upon its designer and builder. Having a dry and wholesome, though primitive habitation for a home, I was able to start cultivation immediately. Before leaving the Old Country, I calculated what crops it might be possible to raise the first season, and brought a small selection of seeds, in addition to cuttings, and a few roots, so that no time was wasted in looking for supplies locally. Most of the roots and cuttings died from the effects of overheating on the long railway journey from Halifax to Vancouver Island, where I intended to settle, and vitality was further impaired by the weeks' delay in looking for land. With the seeds I was more fortunate, and had the satisfaction of producing a vegetable marrow, 17 pounds weight, at Westminster Exhibition. Among my seeds were six small potatoes of the early Ashleaf Kidney variety. When the package was opened the tubers were sprouting vigorously. Being anxious to obtain the best results in order to raise seed for the following year, I found some empty tins, in which a potato cutting was placed, with a little mould. In about ten days I had a little plot prepared in which the spuds were placed, and I was rewarded by a bountiful crop, which yielded enough to plant a fair sized plot the following year. After getting in the first crop of seeds and harvesting the produce, I then set about to prepare ground for raising fruit. The first plot was designed for cane fruits, such as raspberries and blackberries. The site chosen was covered by a dense thicket of vine maples. The branches were utilized in making a temporary rough fence to keep out cattle. The roots made a formidable pile, and could have been cleared off, along with large quantities of decayed timber and stumps, by burning, but, instead of burning the mass, I decided to bury it. My reason for adopting that method of clearing was because the land was on the crest of a ridge with a soil containing a large percentage of sand and water-worn stones. Porous soil of that character requires fibrous material incorporated with it in order to provide plant food, and to retain moisture, a most important consideration on the top of a hill, where the only moisture obtainable comes from the clouds and the dews. Having decided on the burying process, a strip of ground was marked off, about 12 feet in width, the loose

surface earth was scraped off and piled in a ridge to one side. In the centre, a trench, four feet wide, and about four feet deep was dug. The sub-soil earth was piled on the side opposite to the ridge of surface earth. Into the bottom of the trench were thrown all the roots and decayed timber roughly flattened down. Among and on top of this, was shovelled in the surface earth, containing all the weeds and seeds. This was also roughly levelled. In order to ensure fermentation of the timber and weed refuse and the destruction of the buried weeds and seeds, a layer of green materials, consisting of young ferns, green leaves and twigs was laid, about a foot deep, and pressed closely down. The sub-soil earth was then filled in on top, and, being free of seeds and roots, was, for years, entirely clear of weeds. On the centre line of the trench a furrow was made, and a little rich mould introduced to start growth of the young canes. Within two years the roots of these cane fruits seemed to reach the buried materials, and then arose an array of vigorous and hardy canes, that for luxuriant growth, rivalled those grown on the rich bottom lands of the low ground, while the fruit was so firm in substance that, when boiled into jam, it did not go into soft pulp like the fruit grown on low ground. Cane fruits planted in the ordinary way, have a tendency to extend their roots laterally, and to spread so rapidly as to become a nuisance, but, planted on the trench system, the roots appear to take a downward growth, and the intervals between the rows were almost entirely free of side shoots. In burying timber, there is always a risk of producing objectionable fungus, and many lawns and gardens are spoiled thereby, but when the fermentation process and deep burying are adopted, no such risk is incurred. The plantation of cane fruits was not intended for a permanent plot, but merely for nursery purposes, the propagation of plants for future extensions. The small plants were therefore set close together, but in lines four feet apart, the aim being to transplant about three-fourths of the number into fresh ground, and the remaining plants to stand at the usual interval of three feet or thereby. By the time the plants reached maturity, and gave evidence of having reached the buried material, I noticed that their extraordinary vigour was not accompanied by a lateral growth, as happens in ordinary planting, and I decided to let them stand as they were. In order to give the fruit canes the maximum of sunshine and air, I devised a system of training that proved very simple and satisfactory. Posts were driven in at 6 feet intervals in the rows, and sawn off about three feet above the ground. Broad 'tis or straps, about 5 or 6 feet long, with 1-inch augur holes at 18-inch intervals, were nailed to the posts. Slender rods of small pines were slipped through the augur holes, the bottom and top rods on one and the same side of the canes. The middle rod was inserted on the opposite side of the canes, thus pressing them against the other rods above and below. This brought all the canes into an erect position, and were held there by the gentle pressure of the horizontal rods, without the need for tying. In a few minutes the canes could be neatly and securely arranged, to prevent crossing and abrasion of the stems. This simple device was a great saving of time compared with the ordinary method of tying or

railing in loosely. It secured the maximum share of sunshine and air to every cane. The blossoms were not broken or destroyed by swaying against each other, and the fruit was easier seen and picked. When the young canes grew up they could easily be pushed inside the horizontal rods and thus protected from injury. The formation of the trenches was designed to get rid of the surface rubbish, and to utilize it for the production of vigorous plants, and was a deliberate plan for these ends. The extraordinary results in the production of fruit, were not planned, but were rather a discovery, resulting from observations on plants grown under novel conditions, and worthy of a place in what is known as "intensive cultivation." Under this "intensive" system, I found it possible to grow 4 plants in place of one, on the ordinary system. For several years I kept a record of the fruit obtained from these "intensive" plots, and was agreeably surprised to find that the ratio of production was in proportion to the number of plants maintained. Thus, instead of one plant to the lineal yard, I had four, and, as a result, four times the quantity of fruit over the ordinary system. Some years ago, Messrs. Rennie & Co. of Toronto, in their Annual Catalogue, published the results of an experiment in Ottawa Experimental Farm, with one of Mr. Burbank's famous new blackberry fruits. The yield per acre was given as 10,000 lbs., and was evidently considered a phenomenal result. The year of that experiment coincided with my first record of another fruit, considered inferior to the new variety. When I saw Messrs. Rennie's announcement, I looked over my notes for the same year and found that the yield for my inferior fruit was over 20,000 lbs. per acre. Being very much pressed for time, my plot received no attention whatever in cultivation or pruning, and I quite anticipated a reduction in the yield, but, to my amazement, the figures for the second year bounded up to over 34,000 lbs. per acre. Had I been able to attend to my plots, I have no doubt that I could have brought the yield up to 40,000 lbs. per acre.

My phenomenal success landed me in a strange and awkward predicament. There I was, in the heart of the forest, with a profusion of perishable fruits, demanding hourly and daily attention. To market the fruit locally in a fresh condition was impossible, as half of my time would have to be spent in travelling over a rough trail in hot summer weather. To get out of the dilemma I decided to convert all perishable fruits into preserves, and forthwith started business as a manufacturer. Having in early youth seen the process conducted, I had no hesitation in making the attempt, especially as I had, in previous years, made small quantities of preserves for personal use. At daybreak, after an early breakfast, I started and picked fruit all day, placing the baskets in a cool place till next morning. The fruit, being all carefully picked and undamaged by packing and hauling, was in a perfect condition, and the product was of the finest description.

At the close of the season I filled small sample glasses and brought them down to Vancouver. At first most of the purchasers were sceptical of my ability to make jam, but, to quote an old Scotch saying, "the proof o' the puddin' is the preein' o't," and a taste of the samples settled the matter in my favour, and I had no

difficulty in obtaining a fair price for my wares. Financially, the method of marketing fruit in preserved form, was much more profitable than the precarious and troublesome one of selling it fresh. The yield per square yard, realized a maximum of one dollar and eighty cents. With a little extra attention to cultivation and pruning, that might easily be raised to two dollars per square yard, but, taking as an average, half that figure, or one dollar per square yard, a fabulous amount may be raised from land under fruit, when grown on the intensive system.

The foregoing cultural remarks apply to cane fruits such as raspberries and blackberries, but, applied to currants, I found the system equally satisfactory. With strawberries, I started to make some experiments that promised good results. I brought a few plants with me, and had some sent after me, a few months later. Being misled by statements about the mildness of the winters, I did not take sufficient precautions against severe frosts, and, consequently, lost nearly all my imported stock. From the few surviving plants, it took about 5 years to raise stock sufficient to plant cropping beds. The stock of plants had reached about 12,000 and I had just started to plant out the cropping beds, viz., during a few hours' absence, my rough barricades that served for fences were broken down by a herd of starving cows from an adjoining municipality, and every green thing on my clearing was devoured or trampled down. This disaster ruined my strawberry prospects, and I had to start again to raise a stock of plants. Before attaining that object, my health had broken down, and my plans in strawberry culture have never been realized.

In the treatment of fruit trees, chiefly apples and plums, I followed the same system as adopted for cane fruits, but, instead of continuous trenches, I dug pits about 6 feet wide and about 4 or 5 feet deep. An examination of fruit trees in the surrounding districts led me to think that there was some serious deficiency in the soil. Everywhere I found the trees broken down with the weight of the crop, and a system of propping in use to support the branches. In pruning trees for friends in different localities, I found that the twigs were so brittle that they broke easily when slightly bent. This weakness I attributed to an absence of silica in the soil, and in planting my own trees, placed some clay, containing silica, in the pits. This application, in addition to the roots having abundance of woody fibre to draw from, had a magical effect in strengthening the twigs, which when pruning time came, were as tough as wire. When the fruit came, in dense clusters, the branches bent, but did not break. It seems to be a law of nature that, to improve the fibre of trees, woody fibre is the appropriate food for the roots. The solution of this problem of preventing the breakage of fruit tree branches may have the further advantage of improving the general strength of the tree, and enable it to stand a greater degree of cold than otherwise.

Another highly interesting experiment I made with apple trees as well as other fruits, was the colouring and flavouring of the fruit by the application of certain ingredients to the soil. It is a well-known fact that apples and strawberries and many other fruits, as well as vegetables, have a large percentage of iron in their composition. Much of the soil in the district around here is deficient

in this property, and I found that my clearing was of that character. In digging trenches and pits however, I found abundance of the desired material in the form of hard red cakes of sand. Pulverising this material, I applied a dressing of it to the soil around the trees and plants. The mark of a highly developed fruit is the depth of the colouring under the bright external skin. My apples of the "Wealthy" variety were coloured to the very core, and the flavour was equally satisfactory. Similar results were obtained from strawberries. Potatoes were treated in the same way, with the best results. In London, England, the capital of the Empire, the potatoes that command the highest price are known as "Dunbar Reds," from being grown on red soil. Dunbar being in my native county, I am able to describe what that is: The soil is dark red in colour and consists of red sand of the old red sandstone formation, and a strong heavy clay. Potatoes grown on this soil are easily recognized as they are mostly boiled in their skins. When the skin is removed, the tubers have a rich yellow appearance, caused by the presence of iron in the soil, and the flavour is very pronounced, and held to be superior to any other potato. When I came to B. C. I had a hankering after a bit of red soil, but could not get it. You may judge of my delight in finding that a dose of red sand produced potatoes with the very same characteristics as "Dunbar reds."

In clearing forest land for cultivation, I adopted a system different to that usually followed. The common practice is to burn all the unmarketable timber, whereas, I buried the decayed parts, and used the sound parts for domestic fuel. On heavily timbered land, there are immense quantities of material remaining after satisfying household needs. The disposal of this material by burning yields an enormous volume of heat that may be profitably utilized by consuming it in a furnace and heating ranges of glass houses for the production of plants and fruits during the winter months, and thereby affording employment to the whole staff required for open air work during summer. In this way, every fragment of timber can be put to a profitable use, instead of being wasted in useless and dangerous bonfires. The potash obtained by the furnace system can be stored under cover till the proper season, when it can be applied with precision, and the best results produced.

Another interesting experiment made was to test the adaptability of the soil for the cultivation of wheat. For 5 years I kept a flock of poultry, and found it very difficult to get sound and good wheat for their food. I had been told by several parties that wheat could not be grown successfully, as the straw was so weak that it would not keep erect and permit of the ears ripening. A small patch was sown in October, and it grew well, but would not stand up when the ears filled, just as I had been told. Using the same plot for a second experiment, I spread some pulverised clay, containing silica, and dug it into the soil. The wheat was then sown and arrived at maturity, but did not fall, although it encountered a heavy fall of rain a few days before ripening. It stood the test perfectly, and not a straw bent or broke. A further test was made to ascertain the difference in time of ripening, between autumn and spring sowing. This test showed that autumn sown wheat ripened two weeks earlier than spring sown. It is therefore, quite possible

to grow wheat successfully in this district, and to have it ripened so early as the 1st of August. The dressing of clay mentioned above was at the rate of 160 bushels per acre.

In attempting to solve the problem of the feasibility of growing wheat successfully in this district of the lower mainland, I was led to make investigations into the question of rainfall. The summer of 1902, reckoning from my arrival in April, till 23rd October, when the usual wet season commenced, was an ideal one of continuous, bright, sunny weather, punctuated by timely and copious rainfalls, of short duration, that kept vegetation of all kinds, in a healthy and vigorous condition. Having heard contradictory statements regarding the rainfall of the district, that were rather bewildering, I started, on 23rd October, to keep a register of a simple and primitive description, of the rainfall. For nine years, I kept a record, and satisfied myself of the true state of matters, and gained a stock of knowledge regarding the doings of Jupiter Pluvius, and of Aquarius, the Water Bearer, both curious and instructive. The long spell of warm and dry weather suggested that the laws of compensation, whereby the weather pendulum would preserve the balance true, by a spell of cold and rain, seemed inevitable, and it was so. The first year's record showed 114 inches, and a long way above the annual average for the nearest observing stations, which were about 100 inches. The explanation of such a discrepancy was, that the heavy autumnal fall in 1903 started several weeks earlier than 1902, and my record for the 12 months thus contained two heavy autumnal falls instead of one. The present system of keeping rainfall records by the year, and ending on 31st December, is liable to the same irregularity. Instead of mid-winter, the adoption of mid-summer, when the rains are at their minimum, would be a better time to secure records undisturbed by erratic and phenomenal periods of precipitation.

From time to time I had opportunities of comparing my figures with those of other observers, to east and west of me, and usually mine were higher than the others. The other observers were on the low ground, and only a few feet above sea level, while my point of observation was on the apex of the ridge, dividing the Fraser valley from Burrard Inlet, and about 660 feet above sea level. The heavy annual rains of autumn in this district do not, as many people imagine, come direct from the Pacific Ocean. As pointed out by Lieut. Maury, in his delightful book on the Physical Geography of the Sea, the source of our heavy rains is not in the Northern, but in the Southern Pacific Ocean. The warm vapours there, after the sun passes the equinoctial line, ascend vertically, into the upper atmosphere, and are carried by the upper current of the south-west trade wind, until they meet with the cold air of the great continental mountain ridges running parallel to the coasts, from the Arctic regions to Cape Horn. When the warm and water-laden clouds meet the cold air of the mountains, condensation takes place, and the resulting rain clouds drop to a lower level, where they meet with the counter south-east trade wind, and we then get our share of the bountiful warm rain, that goes a long way to modify the severity of the climate. In looking at the map, I found that, bearing exactly south-east, the direction of the wet winds, and distant about 63

miles, was the great mountain mass of Mount Baker. Between it and my point of observation, there is no high land, and I have often seen this magnificent mountain, capped and wrapped in a dense mass of clouds, prior to a local deluge. Behind me, to the north-west, and in line with the south-east current from Mount Baker, are the mountains that are such a prominent feature in the landscape around the northern limits of Burrard Inlet, and culminating in Mount Garibaldi which rises to about 8000 feet above sea level. Finding my point of observation right in the line of the aerial current coming from Mount Baker, I came to the conclusion that the liberal share of the watery mercies in my neighborhood might be accounted for by assuming that a current of air, laden with moisture, is analogous to a current of water in a river, wherein the velocity is greatest in the centre of the stream, and least at the sides. Applying this analogy to the current of air from Mount Baker, I felt that the reason for my higher record in the rainfall was satisfactorily explained. In watching the rain register, I was astonished at the rapidity of the rainfall, and, several times, got readings showing a fall of one inch in twenty minutes. After discharges of that kind, it was noticeable that the rainfall very soon ceased, the clouds broke, and the sun shone out and formed brilliant rainbows on the adjoining low grounds, where the rainfall lingered and drizzled, long after it had stopped on the high ground, thus affording another analogy to the waters of a river being most rapid in the centre, and most sluggish at the sides. This phenomenon leads to a curious result, confirmed by the records of the Provincial Meteorological department for 1896, as given in the table published in the Government Year Book on page 206. At three places mentioned therein, viz:

Esquimalt, French Creek and Agassiz, records are:

Rain in inches	38	33	64
Days of Rainfall . .	159	136	128

Agassiz, with a rainfall nearly double that of the others, has a rainy season 31 days shorter than Esquimalt. It is therefore, possible to find a district with a heavy rainfall, enjoying more dry days and sunshine, than those with a lighter rainfall, a beautiful illustration of the compensations in the machinery that govern the rains and winds. This brightness of atmospheric conditions is greatly enhanced on elevated ground, by the immunity from sea-fogs, which rarely rise beyond 300 or 400 feet above sea level. One of the strangest meteorological sights I ever beheld, happened in December, 1906. About the third day of the month, a violent hurricane of S.W. wind struck this coast, and brought down many of the old trees in the forest. Three days later, another storm, equally violent, from South-east, blew with terrific force, from about mid-night till day-light, and brought down many of the forest giants. I lay in bed, listening for hours to the crashing of the falling trees. About 4.30 a.m. rain began to fall, and the wind less violent. Shortly after, I heard a rushing sound, like a furious gust of wind approaching. The sound became louder and culminated in a crash, resembling a broadside from a battleship, and I sprang out of bed and looked out. Before the sound came, the darkness was intense, and nothing could be seen. When I looked out, the forest was lighted up as with the noonday sun, and I distinctly saw flames coming from the ground in a thicket of leafless underbrush. I came to the conclusion

that a large dead fir tree had been blown down and ignited by the concussion. The light had a pale phosphoric appearance, lasted about 5 minutes and then gradually died out. Going back to bed, I was startled about an hour later by another explosion. I again looked out and saw the forest lit up again, but, about 250 yards away, and not so bright as the first display. Going back to bed again, I lay till daylight and then went out to the scene of the first fire, not over 50 yards from where I viewed it. To my surprise, the tree I thought had fallen was still standing, and, on the spot where the flames appeared, no traces of any fire were visible. It then dawned upon me that the strange sound and sights I had witnessed had been caused by a meteor. Going to the scene of the second light, I found that a huge block of cedar, about 69 feet in length, and two feet in breadth and thickness, had been broken off an old hollow tree, standing in a position, well sheltered from the wind that raged that morning. The block is still lying where it fell, and, if my surmise is correct, the mark of the meteor, and perhaps its body, may be found. On referring to the chapter on Meteors in Olmsted's Mechanism of the Heavens, I found that a secondary display of meteors may be expected in the morning hours about the 6th of December, when the constellation Leo is in the South-eastern sky, so that unconsciously, I had been witnessing an annual event, predicted in astronomical works. After seeing such a wonderful sight, the thought struck me that I had seen the bush burning but not consumed, as was done of old by Moses the law-giver. "*Nec tamen consumebatur*," burning, but not consumed," are the words surrounding the burning bush on the badge or emblem of the Scottish Presbyterian Church, and the incident naturally recalled pleasant memories of the olden time.

In offering these crude and rambling notes, my aim has been to point out the causes of the local land depression, and to throw out a few hints upon the practical questions that embarrass and dishearten amateur cultivators, with the view of encouraging them how to overcome difficulties. I have also attempted to point out the fallacy of that pernicious teaching, which seeks to brand cultivators of the soil as an inferior and uncultured race of beings, and to show that in rural life, there are greater opportunities for an all-round development and exercise of the mental faculties than in any other sphere of human effort.

In scattering these seeds, I trust that they may fall into good soil, and produce such fruit as may help British Columbia to lead the way in the basic industry of land cultivation, the surest of all foundations for national prosperity.

WM. SINCLAIR.

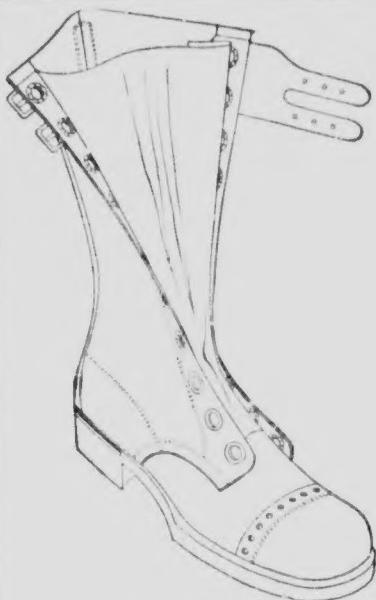
Read to St. John's Literary Society, Vancouver, 12th January, 1915.

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